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"O fortunatos nimium sua si bona norint
"Agricolos." . . . VIRG.

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AGRICULTURE.

[The following is one, from amongst other Agricultural tracts collected by General Harper, on his late tour in Europe, and placed by his politeness into the hands of the Editor of the Farmer, to be used in such manner as he should think proper for the benefit of the American Agriculture.

Editor Amer. Farmer.]

ON THE HUSBANDING OF FARM-YARD MANURE, AND ON OTHER RURAL SUBJECTS.

To THOS. W. M. COKE, Esq.

HONoured SIR—After the minute inquiries into the subject of Manures, and the copious elucidation thereof upon chymical principles, carried on and developed by able philosophical men, it will appear presumptuous in me (an humble individual, having no pretension to scientific knowledge) thus taking up the pen, and attempting to follow such high authorities in explanation, and even in some respects advancing opinions at variance with theirs.

But, Sir, as the published Reports of those eminent men's labours rarely fall into the hands of practical farmers, and are but imperfectly understood by them, I am induced to step forward, and endeavour to express my ideas upon a subject so important to agriculturists, in a plain manner, and not liable to be misunderstood by practical men, to whom the following hints may prove more acceptable, from being the result of practical experience, and not founded on theory alone.

Although I address myself to you, Sir, at the present moment, I may in fact be considered as attempting to explain my sentiments to the numerous, intelligent, and highly respectable tenantry upon your extensive Norfolk estates, men whose liberality will, I am convinced, excuse me in any harsh expression which may drop from my pen while attempting to deliver my sentiments upon a subject with which their respective interests are inseparably connected. Some men, who have had the advantage of superior information, will consider the greater part of the following observations as extraneous, unnecessary, and perhaps uncalled for; and to such men they actually are so; but they will please to recollect, there are many very meritorious occupiers of land, who have not had the same means of obtaining information upon agricultural subjects, and that to such persons the following hints may be of service; and I may be allowed the privilege of saying, without much fear of contradiction, that it sometimes happens, where farmers have by means of precept, example, or dint of experience, obtained a competent or even superior agricultural knowledge, they do not always practise to the extent of their information. *A monitor is a wholesome physician for the frailties of human nature though not always an acceptable one.*

I will now, Sir, enter upon my subject, and will, with your permission (with a view to ease and freedom in expression) consider myself as addressing my remarks to your tenantry.

I will not attempt to enter upon the wide range of Manures generally, but confine my remarks more particularly to what has been aptly termed the Farmer's Sheet Anchor, FARM YARD MANURE.

My observation and experience justify me in stat-

ing, that the husbanding of farm yard manure is (generally speaking) either imperfectly understood, or not sufficiently attended to in the county of Norfolk.

The principal error in the common method of manufacturing farm-yard dung, in Norfolk, originates with the prevalent custom of keeping the dung arising from different descriptions of animals in separate heaps or departments, and applying the same to the land without intermixture, and in an improper state.

It is customary to keep the fattening neat cattle in yards by themselves, and the manure arising from them is of good quality, because the excrement of fat cattle is richer than that of lean ones; fattening cattle are fed with oil cake, corn, Swedish turnips, or some other rich food, and the refuse and waste of such food thrown about the yard, increase the value of the manure; it also attracts the pigs to the yard. Those industrious and useful animals rout the straw and dung about in search of grains of corn, bits of Swedish turnips, and other food, by which means the manure in the yard becomes intimately intermixed, and is proportionally increased in value. The feeding troughs and cribs in the yard should (for obvious reasons) be shifted frequently.

The store neat cattle are also kept in yards by themselves. The manure arising from them is of a very inferior description, and it frequently happens that a superabundance of straw is thrown out of the barn at one time, more than the stock in the yard can tread down properly; besides, there is not now the same inducement for pigs to rout the straw about in the yard as there was previous to the introduction of threshing machines. The barn door in the store cattle yard is now the principal attraction for pigs and they in a great measure neglect the other parts of the yard, unless where the stock of pigs kept is so large that they are compelled, by the imperious law of necessity, to seek out for their sustenance in a more distant and less productive station than immediately at the barn door.

The horse dung is usually thrown out at the stable doors, and there accumulates in large heaps: it is sometimes spread a little about, but more generally not at all, unless where necessary for the convenience of ingress and egress, or perhaps to allow the water to drain away from the stable door. Horse dung lying in such heaps, very soon ferments and heats to an excess: the centre of the heap is burned or charged to a dry white substance, provincially termed *fire fanged*. Dung in this state loses from 50 to 75 per cent. of its value. The diligent and attentive farmer should guard against such profligate waste of property. The remedy is easy, viz. by never allowing the dung to accumulate in any considerable quantities at the stable doors: suppose it was an established rule that every day, as soon as the yard-man has gone through his regular routine of morning's work, such as foddering cattle, feeding pigs, &c. he should take a horse, or some other draught animal, with a light cart, and remove the horse dung from the stable doors, and spread it about the store cattle yards. To this plan will be objected the pleas of trouble and expense: in answer I have to say, *trouble* should never be considered by industrious farmers; and I think I can readily prove, there will be no additional expense in carrying the plan into effect.—The yard-man having finished his morning's work of foddering cattle, feeding pigs, &c. seldom does more than idle about the yard, and leaning upon his fork until the stock require a second supply of food. His spare time would be more beneficially employed in removing the horse dung, which, at most, would not

be more than half an hour's job of a day. There generally is, or always ought to be, about every farm premises, a light cart, for what is called *odd jobs*. These carts will be very suitable for removing the horse dung, and as to animals to draw those carts, there are few farms without having one or more idle horses, or other beasts of burden, upon the establishment; such, for instance, as a favourite old hack-horse, a mule or poney to carry the errand boy, a mare that has a foal, or a horse a little lame, and not fit for constant work, an old working ox turned off to fatten, a bull, (where one is kept) a little gentle work would do him good, inasmuch as it would keep him more quiet in the pasture; or even suppose the master or mistress's gig horse was used occasionally for half an hour of a day at dung cart (when not otherwise wanted) it would be of great service in so far as keeping the horse in regular exercise; and by that means prevent fatal accidents which frequently happen where high-spirited gig horses are not kept in constant exercise.

The dung from the feeding hog sties should also be carted and spread about the store cattle yard in the same manner as the horse dung.

Opinions are much at variance as to the proper form of dung yards: some theorists recommend the yards to be made so much concave as almost to amount to a well shape, giving as a reason in support of their opinion, that the virtues of dung can only be preserved by being saturated in urine, or some other moisture. Others again assert, that dung yards should be formed convex, and assign as their reason, in support of that form, that farm-yard dung should be kept dry. Practical experience points out that a medium between those two extremes is the best, and a yard a little hollowed is the most common shape.

Much has been said and written upon the subject of the valuable properties of urine, and of the weepings of farm-yards, as manures for grassland. It has been recommended to collect the whole wash of the farm yard in reservoirs, and to convey it from thence into the fields in water carts; but this theory should not be reduced into practice unless it is conjectured that the benefit to be derived from the manure so conducted covers the expense.

It is a good method (where situation will admit of the practice) to collect the wash of farm-yards into tanks, where a body of water can be thrown into it sufficient to effectually irrigate some adjoining piece of grass ground, situate upon a lower level. It is also an advisable method to throw litter, scourings of ditches, and such other refuse into the tanks, in sufficient quantity to absorb the urine and wash off the yards which run into them. Compost, so collected, is admirable top dressing for permanent grass lands, or for young clover layers.

But to revert to the subject of farm-yard dung; it is a common practice (previous to the dung being drawn out of the yards into the fields intended for turnips) to prepare what are called *good bottoms* for the reception of the muck. This is done by collecting considerable quantities of clay, marl, or such other material, in heaps where the dung is to be placed—these bottoms are formed to the squares (length and width) of the intended dung heaps, and are from 12 to 18 inches thick. This is done with an idea that the juices of the dung will descend into the bottoms. (The fallacy of such reasoning will be pointed out hereafter.) The bottoms being prepared in the fields, the dung is then carted to them from the yards; in this operation, the materials of the bottoms is pressed down very close, by reason of the carts constantly turning upon them when delivering

their loads; the carts are tipped up, and the dung shut out. Men are placed at the heaps, who throw the dung up *lightly* with forks to the height of five or six feet, making the heaps to cover the square bottoms previously formed. In clearing the yards, it is customary to begin on one side of a yard, going regularly forward, until it is emptied, and then begin on a second, by which means the dung arising from different descriptions of animals is kept apart, and is ultimately applied to the land without intermixture; and as to the horse dung, the residue of it which is left from fire-fang and charing, is considered strong dung, and as it is generally understood that a smaller portion of it than of common yard dung will answer the intended purpose, it is usually (as a point of economy) to save carriage, taken to the most distant parts of the farm, and this very frequently without any reference to the nature of the soil (whether clay or sand) to which it is to be applied.

Dung heaps formed in the manner I have described (when the dung is good for any thing) very soon ferment to a violent degree. The gasses ascend and evaporate: the juices, alas! in place of descending into the hard beaten clay bottom, as was expected, ooze out at the side of the heaps, and are soon dried up and lost. In a short time the fermentation subsides, and leaves the centres of the heaps burned or charred, while the outsides of the heaps are dried up to chips by the natural effects of sun and wind. In this state these miserably mismanaged heaps of dung remain until the near approach of the turnip sowing season; they are then turned over, and the clay bottoms mixed with the dung; a partial fermentation succeeds, (and this turning and mixing the bottoms form the only rational part of the manufacturing process) for by this improvident system the quality of the dung is not only materially deteriorated, but the quantity very much reduced, so much so, that by the time the farmer has sown half his turnips, he finds his dung expended: he has then recourse to oil cake, or perhaps sows a part of his turnips without any manure at all. If the soil is of a nature to produce turnips almost spontaneously, there will be a crop even under the worst management; but when not of that happy admixture, and managed as I have before described, it follows as a matter of course that the crop fails; nevertheless the farmer is so much of a philosopher, that he consoles himself with the idea that he has done his duty by the land, believing that it is naturally so *unkind for turnips*, that it would be a perfect miracle if he was to have a good crop of them upon such land.

And here I must beg leave to apologize for the high colouring of the foregoing stricture. It is certainly neither my wish nor intention, more than my duty or interest, to give offence to the respectable body of men to whom I may be considered as applying the foregoing observations; but I consider it in some degree necessary for my purpose to rouse the feelings to a spirit of inquiry, and having done so I ask the candid observer to take an impartial view of the subject, and say whether these things are so? I may be told, that to speak the truth is in some cases a libel; if so, I stand convicted; however, if in speaking the truth in the present instance, I provoke an inquiry which may in the result terminate to the advantage of the parties concerned, I shall consider myself a fortunate railer indeed, however uncourteous my remarks may appear. As it is a failing in human nature to too frequently misinterpret our friends' best intentions, particularly where people cannot bear to be told of their faults; and as it is more easy to see others' faults than one's own, I will take it for granted, that the majority of the readers of the foregoing observations consider them more applicable to their neighbour's system of management than to their own, I am, however, not without hopes, that some few liberal minded, unprejudiced men, will acknowledge at once that the cap fits themselves, and from each man I entertain the greatest hopes of improvement.

Having pointed out what I consider the principal errors in the prevalent or common method of husbanding farm-yard manure, I will now endeavour to explain my ideas of what I consider a more perfect

system, and if I am correct in the opinion I have formed on the subject, I will venture to say, there can be no difficulty in producing upon the farm a sufficient quantity of yard muck or compost to manure the whole of the turnip land upon any farm, in a medium state of fertility, cultivated upon the four course husbandry; and if my premises are correct, the occupier may then reserve the whole of his stipulated quantity of oil-cake for his wheat crop, that description of manure being certainly more adapted to the wheat than to the turnip crop.

As the great object I aim at in the following hints is to improve the quality as well as to increase the quantity of farm-yard manure, I strongly recommend indeed I consider it indispensably necessary, that all descriptions of farm-yard dung should, in the first instance, be as intimately mixed together as possible, and that particular attention should be paid to the husbanding of the horse dung, which should without fail be removed daily into the store cattle yards in the manner I have previously recommended. An abundant stock of pigs should always be kept in the yards—no dry straw should be left to blow about the stack yards; all should be brought into the cattle yards. Nettles, thistles, and other coarse weeds (not in seed) should be brought into the yards, and not allowed to die and waste in the fields and ditches when they are cut down. The horses kept on the farm should be fed with green food in the yards in the summer months, and they should also be allowed to run loose in the yards in winter, having stables or sheds to go into at pleasure. The yards, stables, and sheds should at all times be kept well littered with straw. The soap lees from the farm-house should be carefully preserved, and thrown upon the dung in the yards—saw-dust, leaves of trees, road scrapings, scourings of ditches, in short, all animal and vegetable substances should be carefully collected and thrown into the farm-yard.

When it is found necessary to empty the dung yards early in the season, whether with a view to make room in the yards, to expedite spring work, or to employ the teams in unfavourable weather, when they could not otherwise be employed to advantage upon the farm, I recommend that preparation should be made in the usual manner for the reception of the dung heaps in the intended turnip fields, viz by collecting large heaps of clay, marl, or such other material. The bottoms for the heaps should not be laid above six or eight inches thick of the material, and a large quantity of it be placed in rows on each side of the bottoms marked out—the dung should then be drawn out of the yards, and placed upon the bottoms, but not in the usual way of throwing it up loosely to cause fermentation, on the contrary, by drawing the carts with their loads upon the heaps, for the purpose of compressing the dung, and thereby preventing fermentation. One or two men (according to the number of teams employed, and distance from the yards) should remain constantly at the heaps while the teams are at work, on purpose to spread and level the dung regularly, so as to render the ascent easy for the succeeding teams as they come with their loads.

If the dung has not been previously mixed in the yards, it should be so in drawing to the heaps, by means of taking up a few loads from one yard, and then a few from another, alternately, and even from the same yard the loads of dung should be taken from different parts alternately, by reason that the dung is not of equal quality, nor made with the same regularity, in all parts of the yard.

The coal ashes, road scrapings, and all other collections of manure about the farm house should also be carried to the dung heaps in the fields; and when the heaps are raised as high as convenient for the horses to draw up, several loads should be shot up at the ends of the heaps, for the purpose of making them up to the square of the centre: the whole heaps should then be completely covered with the marl and clay, or soil previously collected in rows by the sides of the heaps; and if there should not have been a sufficient quantity of material collected in the first instance, more should be got ready without loss of time, so as to effectually enclose the dung heaps

in crusts, and they are thenceforth denominated *pies*. The dung will be preserved in the pies in a very perfect state, with little or no deterioration or diminution without fermentation, and without loss by exhalation or evaporation. The pies should remain in this state until within ten days or a fortnight of the time the manure will be wanted for the turnip ground, when they should be turned carefully over, and the crust, top, bottom, and sides intimately mixed up with the dung: when the turning is completed, immediately plough several furrows of the natural soil all round the heaps, and with the loose earth ploughed up, again coat the heaps all over; the pies will then take a gentle fermentation; the earth intermixed with and covering the dung will absorb the juices and gasses of the dung, and the compost come out in a fine state of preparation for using on the turnip land.

When turnips are sown in the Northumberland ridge system, the drills should be split open, the dung taken from the pies, and spread in the rows, then covered up, and the seed sown immediately in the fresh earth—the whole operation should, if possible, be completed in the same day, when every ridge or drill forms a little hot bed, to encourage the vegetation of the plants, and force them speedily out of the reach of the turnip flies.

When dung is taken out of the yards late in the spring, or only a short time before it is wanted for the turnip ground, the preparation should in some degree differ from the foregoing, because of the pies or compost heaps having less time for incorporating. I recommend the following process for preparing dung late in the spring. First let the bottoms and side heaps of earth be provided, in the same manner as for the winter heaps, but the dung should not be carted upon the heaps to compress them, and prevent fermentation as in winter; on the contrary, the dung should be thrown up lightly with the fork, upon the bottoms, and the side heaps of earth mixed intimately along with the dung, which answers the double purpose of reducing the straw part of the dung to a proper state for applying to the land, and prevents an excess of fermentation in the centre of the heaps. When the heaps are raised sufficiently high, and extended to cover the squares of the bottoms prepared, the natural soil of the field should be ploughed up all round the heaps, and thrown upon them, in the manner heretofore directed; the pies will then take a gentle fermentation, and soon be ready for use. The time required for preparing the manure in this manner must depend upon the strength of the dung, and the quantity of clay or marl thrown up along with it. Experience will soon point out the proper quantity of marl to be applied, and the necessary time for the pies to remain before they are used. Turf turned up for a year preceding, on wastes by the sides of roads, makes excellent pie meat. Good compost heaps applied to land have the effect of renovating soils worn out by arable culture and stimulating manures.

Objections (on the score of expense) will be raised against the system I have recommended, but when it is considered that the greater part of the additional expense is in manual labour, surely that objection should have no weight in the scale, when weighed in balance against the ultimate benefit to the farmer, and the highly creditable method of employing the superabundance of labourers, or excess of population with which the landed interest is at present burthened: in preference to the customary method of supporting the extra labourers and their families as paupers, or which is much the same thing, employing such labourers in what is called repairing the roads, that is (according to the common practice) throwing the dirt from the sides into the centre, and thereby creating a job for some other persons to throw the dirt out again.

This remark leads me to make a few observations on the subject of road making, a subject that although it forms an integral and principal part of rural economy, is but seldom much attended to by those whose interests are most intimately concerned in having good roads.

In a country like Norfolk, where the soil is gene-

rally light and dry, and good materials frequently plentiful, much less expense, attention, or ingenuity is required to keep roads in good order, than in districts less favourably circumstanced, and the greater parts of the roads in Norfolk are kept in good order; but there are, I am sorry to say, (I speak feelingly) some very striking exceptions to the general rule.

The following are prevailing errors in the first formation of roads, viz. omitting to underdrain springy lands, or retentive subsoils, not carrying off (by side drains) the surface water arising from the adjoining lands through which the roads pass, and in neglecting the *inclined plane*, or fall of the water length ways, of the road.

Some eminent scientific men have differed in opinion respecting the form of roads, viz. whether a *concave* or *convex* form is most proper, and both opinions may be supported by well-founded arguments. The vestiges of the Roman roads left in this country indicate that, that wise people formed their roads upon the *inclined plane* and *concave* principle. In modern times the celebrated Bakewell, of Dishley, in Leicestershire, (whose memory will long be revered by agriculturists and breeders of farm stock) was a great advocate for *concave* roads, as was also his cotemporary and intimate friend Mr. Wilkes, of Measham, in the county of Derby: under the patronage and by the direction of those two eminent men, several well-formed *concave* roads were made and completed in the midland counties. Those roads have now stood the test of many years experience, and the principle on which they were made has been subsequently followed by practical men in those counties. In some instances the hollow or *concave* roads have failed, where they were made with bad materials, upon wet bottoms, not thoroughly underdrained; but in general they are found to answer much better than high *convex* roads, because, a heavy-loaded four-wheel carriage, passing along the centre of a *concave* road, presses an equal weight upon the wheels; and as the middle of the road is the lowest, the pressure inclines to the centre, consequently does not shake or loosen the frame of the road. Not so in a *convex* road, when raised in a high arch (which is frequently the case) for it is impossible to keep a heavy loaded carriage in a direct line along the middle of such a road, the carriage naturally veers to one side or the other, and the greater part of the weight of the load hangs upon one wheel, which not unfrequently breaks down from such unequal pressure. The road is also cut into deep ruts; those fill with water from the first shower which stagnates in the ruts, and saturates the road to the foundation. The succeeding carriage wheels jam into the ruts, cut them still deeper, shake the road to its centre, if not cut it quite through.

Convex roads ought to be very well made with good materials, and particular attention should be paid to keeping the ruts well filled up, so as to cause the water, to fall over the *sides* of the road, for it seldom happens that the projector of a *convex* road considers it necessary to pay attention to the fall for the water length ways of the roads; his ideas are rivetted to the principle that water will not stand upon a round road, and he is so far correct, were it not for the ruts, which for the preceding reasons *must* take place.

A *concave* road is less liable to have ruts, and requires less attention in keeping in repair than a high *convex* one: the water naturally runs along the *inclined plane* from the higher to the lower levels, and then forces its way into the side drains.

There are also many well founded objections against roads being made too much *concave*, but it is not necessary to mention them at present, as the principal object of these remarks is to point out and endeavour to correct the prevalent error of raising carriage roads so high in the centre, which is carried to such an excess in some instances as to endanger the lives of the passengers who venture to travel upon them.

The form I recommend is a medium between the two extremes: the road may be a little elevated in the centre, but I consider the principal object which should be attended to in the formation of roads is

the *inclined plane*, or fall for the water longitudinally of the road, and this is so absolutely necessary, that where the road has to pass over a level or dead flat, (which seldom happens) the bed of the road should be formed with an artificial rise and fall. When the road passes down a long descent of ground, it should be so formed as to lead the water into the side drains at short distances, thereby preventing the water from guttering, which it would do if allowed to run any distance upon the road. When the bed of the road is first formed, it should be well rolled or carted upon, and all irregularities filled up; the hard material should then be laid on in a sufficient body in the first instance, for it is a bad method to begin with a temporary covering, which would soon cut through, sink into the bottom, and be lost. The large stones should be carefully broken into small pieces, otherwise they will not cement together. A principal error in the Norfolk method of repairing roads is in laying on field stones without breaking. A moment's reflection will show that large round bodies cannot, and that small acute angles will unite to form a firm base. When large round field stones are broken small they form acute angles; those joint in with each other, and take an equal bearing of the pressure which comes upon them: not so with unbroken round stones; they always remain loose, and carriage wheels pass through, not over them, as they ought to do, which causes very great additional draught, and when such stones are put upon high, cobling roads, it renders travelling very unsafe for a time, until the stones are pushed over the sides of the roads by the carriage wheels, and thereby leaving the centres of the roads in much the same state as before they were attempted to be repaired, with all the time, labour, and expense lost.

Another custom, which cannot be too severely censured, is the imprudent and improvident system of laying bad materials upon roads, when good materials can be conveniently obtained. It is not uncommon to see perfect dirt or sand laid upon roads, which adds fuel to fire, and makes the roads worse than before. The error of this system may be readily explained by calculation.

Suppose the distance from the gravel pit to the part of the road intended to be repaired is one mile; a team, carrying six loads per day, travels twelve miles, exclusive of the distance going to and from work. I calculate the expense of a team of three horses, with a man to drive, including wear and tear, at 14s. per day, and the expense of digging and filling the gravel at 4d. per load, making the whole expense 16s. per day for doing no good whatever, but on the contrary doing a great deal of injury, viz. by cutting up one part of the road by the carriages passing along it in attempting to mend another part, or, in fewer words, making two holes to trying to stop one.

Now, suppose that an additional 4d. per load was allowed for the gravel: it would then be riddled, and I maintain that three loads of riddled gravel will be more efficacious in repairing roads than six loads of unriddled, consequently half the carriage saved.

The comparative statement will then stand as follows:—

To six loads of unriddled gravel, and a team for a day carrying the same	l. s. d.
To three loads of riddled gravel, and a team for half a day, carrying the same	0 16 0
	0 9 0
Saved per day, by using riddled gravel	10 7 0

Besides less injury done to the roads in carting, and what is still of much greater importance, the farmer having his team only half the time employed upon the roads, and the other part of the time to be beneficially employed upon his farm.

Mending the roads is sometimes used as a plea in extenuation of the injurious practice of picking the stones off the land; but I consider the plea inadmissible, because where there are many gravel stones on the surface, it is a sure indication that a gravel pit may be opened to an advantage at no great distance: but a still greater objection rests in the injury which the land sustains from such treatment, particularly

light soils, the staple of which is weakened, and the intrinsic value reduced in a very material degree, by having the stones picked off; indeed I affirm, that no stones should ever be picked off sandy or gravelly soils (and but seldom from any other description of soils) unless when the stones are so large as to impede the progress of the implements necessary to be used in the cultivation of the soil. Clovers and grasses intended to be mown should always be rolled down at a proper season, after the larger stones are picked off.

It is a disgusting practice, and cannot be too severely censured, to pick the field stones into heaps in the fields, and there allow them to lay, as is frequently the case, the year round. This practice is unpardonable in the highly cultivated and justly celebrated county of Norfolk, a county to which most others in the kingdom look up for example. Yet, notwithstanding the general proficiency of the Norfolk Farmer, I may justly apply to them the adage of "Use is second Nature," (let it be remembered I speak in general terms, for there are very many exceptions) in respect to the stone heaps: for the farmer rides over his fields amongst those heaps of stones with seeming unconcern, as if unconscious of the injury he has sustained by having had the stones picked off his land in the first instance, and afterwards by their being left in heaps in the fields to destroy the herbage they lay upon.

In this state the stones lay from month to month, nay, from year to year; and there are instances (though not frequent) where the stones are not removed at all, but are spread about again, and ploughed down when the land is to be broken up in preparation for the succeeding crop of corn.

With this severe, but, I am sorry to say, well founded reproach, I conclude my present remarks. In my hints upon the different subjects I have here alluded to, I have endeavoured to point out a few errors, with a view to correct and improve them. Although my remarks appear to be, and are in fact, a little severe, yet I trust the liberal-minded Norfolk farmers will receive them as (they really are) *well intentioned*. Those gentlemen may rest assured, that although I have considered it a duty incumbent upon me to point out a few prominent errors, there is no person more sensible of their general merits than I am, and no one more ready to bear testimony to their indefatigable industry, intelligence, and general good practices, as agriculturists, and this I may safely say, without any fear of being reproached as a flatterer by any person who has read the foregoing remarks.

To Thomas William Coke, Esq.

I beg most humbly to state—You, Sir, will, I fear, consider that in the foregoing remarks I have done but imperfect justice to the task I had undertaken.

It is, I acknowledge, a bold measure in me thus venturing to censure any part of the celebrated Norfolk husbandry; the principal improvements of which (as has been very justly remarked by a high authority) were *undertaken, matured, and perfected*, through the instrumentality of your patronage, precept, and example.

But although it is generally allowed that the system of husbandry followed in Norfolk is *very nearly perfect*, (more particularly where it has felt the immediate effects of your fostering hand,) I trust, Sir, your liberal mind will excuse me when I venture to say, there are still a few errors or imperfections, which strike strangers more forcibly than they do the eye of the actual cultivators. Some of those errors have been hinted to me, and I have here endeavoured to point a few of them out, and to suggest remedies for their improvement.

It will remain for you, Sir, to judge of the merits (if there are any) or demerits of my performance, which I now venture to lay before you.

I am, Honoured Sir,

Your very humble and obd't servant,

FRANCIS BLAIKIE.

FOR THE AMERICAN FARMER.

PROCEEDINGS OF THE
AGRICULTURAL SOCIETY OF ALBEMARLE.
No. 5.

ON THE CULTURE AND PRODUCTS OF
Ruta Baga & Mangel Wurtzel.

DEAR SIR,—From the frequent scarcity of fodder in our neighbourhood, the want of good meadow land on my own farm—and believing too that our climate was not so favourable to the production of some of the best grasses, as more northern situations; I was induced to cast about in my own mind, for some other resource, just as the promising account of the Ruta Baga, given by Mr. Cobbett, came out in the American Farmer: and I determined to have a fair experiment made of it here. Making some allowance, however, for the glowing statement of Mr. Cobbett, and considering, too, that our soil and climate might be less suited to the production of this article, than his—I thought it advisable to associate in the experiment some other article of good promise. And some information contained in the American Farmer, together with other circumstances, induced me to give the preference for this purpose to the Mangel Wurtzel. (Beta altissima of Botanists.) That I might commence my experiments—with the more certainty of having the right materials to work upon; I requested the favour of the Editor of the American Farmer, last spring was a year, to have me some procured that might be depended upon. Genuine Ruta Baga and Mangel Wurtzel Seed were accordingly sent. The experiment was determined upon, and the seed received too late, to give the Mangel Wurtzel a fair trial last year. But the Ruta Baga Seed, were distributed among some select farmers, both last year and this—and I, too, gave them as fair a trial as I could. But the result of all the trials made, is, a concurring conviction that in our soil and climate, we have nothing profitable to expect from them—though all agree that they produce a rich, fine flavoured, nice little bit of a turnip.

The account of the Mangel Wurtzel is different.—I gave a few seed to Mr. George Gilmer, one of our members and most judicious farmers—who planted them in June last year; and notwithstanding this very late period for planting them, and the last year's great drought—his report was very encouraging. In good time the present year, some seed were given to Mr. John Rogers, and Capt. James Lindsay—both members of our society. The former of these gentlemen, planted his about the usual time for planting common beets—the latter his, much later. I planted on the first of April. Mr. Rogers planted his in a soil of rich, black loam, on a flat near a branch—I, mine on a high, dry, gravelly ridge. Capt. Lindsay's were planted in a soil like mine—gravelly with a clay bottom, but not quite so dry a situation. His soil had been made rich enough for good gardening purposes—mine but little if any more than half rich enough for cabbages—some of which grew on the same soil, close along side of the Mangel Wurtzel, and although planted early and well tended—did not attain but little more than half of the ordinary growth and perfection of cabbages on good ground, in a good season. On the 7th instant, I gathered my Mangel Wurtzel; on the 9th, Capt. Lindsay his, and on the 11th this day, Mr. Rogers his. Two of Capt. Lindsay's weighed 8½ pounds each. Mr. Rogers' weighed three—one weighed 9 lb. 14 ounces—another 10 lbs. 14 ounces, and the third 9 lbs. 12 ounces. Mine weighed—No. 1, 8 lbs.—No. 2, 7½ lbs. No. 3, 7½, and nine others averaged 6 lbs. each—These weights were all without the tops. My No. 1, with the tops, weighed 10½ lbs.—one measured twenty-eight inches in length—a noble fine looking root, firm and solid from one end to the other. Experience has established the belief in other parts of the world, where the Mangel Wurtzel has been successfully cultivated; that the roots will grow about as large, if planted sixteen inches apart in rows, with two feet

space between, as at any greater distance. Mr. Rogers' were planted in the above experiment much closer than this, mine exactly upon this plan—and upon this plan, about 16360 plants would be contained in one acre of ground—multiply this number by the weight of Mr. Rogers' heaviest root, which grew in a thicker planting—and it will show, that agreeably to our experiment of this year—165120 lbs. of this root could have grown upon a less space than one acre—that is, upwards of 73 tons. But one fourth may be reasonably superadded for the tops, which gives us the extraordinary product of 91 tons from less than one acre of land. As different writers, in different countries, have given ample accounts of the value of Mangel Wurtzel roots and tops as food for cattle, hogs and sheep, at least; my object has not been, to enlarge upon this part of the subject at this time; but merely to ascertain, whether the soil and climate of this our section of country, were favourable to its production. I am satisfied that they are in a degree to justify our cultivating it with zeal. In the above statement, I have chiefly confined myself to facts and figures—because they afford a fair foundation, upon which the reasonably cautious will rely—the ingenious and candid may safely descant and improve—while the mere caviller can be silenced.—Having done what is first due to accuracy and certainty, I may now be indulged in a few remarks founded upon opinions. I saw the preparation of the soils, for each of the experiments I have detailed. I noticed the culture and growth of the plants. I was at the gathering and weighing of each root I have mentioned—those raised by the other gentlemen, as well as myself. I know, therefore, so far as I can rely upon the accuracy of my own calculation; that the facts given, are unquestionable.

But from a review of all the circumstances connected with these facts, I am of the opinion, that other preparations of soil, and other seasons, might give much greater products, than those stated. My soil for instance, was not half so rich as it might be made—besides that, it had been very poor ground, too suddenly manured. And I do not know, that it was the most favourable kind of soil or situation any how. Mr. Rogers expressed a conviction, that his was not the most favourable kind of soil or situation. His common beet did not do so well in the soil by the side of the Mangel Wurtzel, as away in another, or other places. Added to this, it is certain, that about eight weeks after our planting, one of those partial droughts, (which affected some neighbourhoods and not others this year,) commenced and continued six weeks so intensely, that all the leaves of the Mangel Wurtzel in Mr. Rogers' and my experiments, (we live two miles apart,) were killed into the leaflets—and when a rain fell about the last of July to start the leaves, another drought of four weeks followed, before the roots could get fairly under way of growing again. Under these circumstances, may we not safely conclude, that greater results may be reasonably expected, than our experiments have afforded? But after all I have said, sir, I must not be understood as intending to convey the idea that, in a general way we are to expect, that the product of a whole acre, however it might be made, will equal the rates of our particular operations. But from showing what is possible, what is probable will readily be conceived by the discerning. Mr. Rogers and I both think, that, more is possible, under the best circumstances, than has resulted from our first experiments. But if we can get the half of ninety-one tons of good wholesome nutritious food, from one acre of land, how well will it be worth our while!! It is excellent land, with a good season, that will produce forty bushels of corn to the acre; that number multiplied by fifty, (about the weight of a bushel of good sound corn,) will give us less than one ton of corn. But suppose fodder and all shall give us two tons—this highest product of corn, opposed to half our product of Mangel Wurtzel, still yields us less than one twentieth. Can any one believe that, in equal parts of corn and fodder, there is twenty times as much nourishment, as in the same amount of Mangel Wurtzel roots and tops! How much more easily too is the Mangel Wurtzel cultivated

and how much less destructive to land! Besides that, this is a hardy thing, no cut-worms in the spring, no early frost in the fall, destroys our expectations. I am so well satisfied of the value of this article in husbandry, if our farmers will only cultivate it properly, that I feel particularly gratified, that Mr. Rogers has been associated with me in the experiments made. You, our other members and the community generally know, that I have no pretensions to much in farming, but theory, and I certainly know but too little of that. The reputation of Mr. Rogers, however, for his excellent and successful practice in farming, is too well established to receive any accession from my commendation. And to him I may refer his neighbours and acquaintances, for useful information on the subject. I have put away all my roots, not to be taken up until next spring, when I will cheerfully divide my little stock with any of my neighbours, who may wish to set them out for a stock of seed. When we have learnt how to provide a good thing we soon learn from various sources how to use it; but a future communication on the culture, history, and uses of the Mangel Wurtzel, will not I think be entirely useless or unacceptable to our society and the public; with the first leisure, therefore, it is my intention to renew the correspondence with you on these subjects.

I am very respectfully,
Your friend and servant,
THOMAS G. WATKINS.

PETER MINOR, Esq. Sec'y of the }
Agri. Society of Albemarle Va. }
Glenmore, Nov. 11th, 1820.

TO THE EDITOR OF THE AMERICAN FARMER,

THE CULTURE AND USES OF THE

BENE PLANT.

Rose-Hill, 24th Nov. 1820.

SIR,—A variety of causes, have prevented that prompt attention to your Philadelphia correspondent, which the importance of his inquiry demanded, and the politeness of his address entitled him to.

In the winter of 1812 and 13, I resided with my daughter in Georgia. The soil, trees, shrubs, plants, course of crops, and mode of cultivation, were all different from what I had been accustomed to. Every thing was new to me, except the manners and habits of the people, with whom I associated. They neither had big houses or big barns, but like the inhabitants of Maryland, their hospitality was unbounded, to all who either deserved or stood in need of their attention.

At the house of my valued friend John M'Queen, Esq. of Oatlands, the Bene plant was first made known to me. It was about the last of February, that dining with him, he requested my opinion of a bowl of fine Cabbage Lettuce; it deserved all the praise which I gave to the vegetable, as well as to the dressing, when Mr. M'Queen smiling informed me, that the oil was of his own produce, from what made, and the value of the crop.

Captivated by the idea of introducing to the almost deserted, poor, sandy districts, on the shores of the Chesapeake and Delaware, a crop which should be as lucrative as the wheat of our best lands, and flattering myself, that I might be the instrument of stopping a ruinous emigration from these poor lands to the west, I procured and brought home with me about two quarts of seed.

This plant was first brought to the south by African negroes, who cultivate it in their patches as a valuable and important ingredient in their pottages, being first moderately roasted. The seed from which the oil is made, is of the shape, and about the size of the *aluke-regi*, or winter cherry, and is pleasant to chew even in a raw state. The pod which contains the seed, is shaped like, and much about the size of a tobacco pod. These pods do not ripen all at the same time; but in succession, like the cotton and oca, and when ripe, must be gathered, or they will open, and the seed will shatter out; they may be easily gathered, by children and infirm persons.

Experimentalist as I acknowledge myself to be, the introduction of the Bene appeared so desirable; that only a few seed were wasted, by attempting late in the season to grow it at this place. But in order to make the most of it, parcels were placed in the hands of Mr. Ridgley, Chancellor of Delaware, Doct. Sykes, a distinguished physician of Dover, and many others, whose names are not recollected; all promised attention, but no report has ever been made to the public or me, respecting their success.

Mr. McQuinn was with his family last summer, at the Saratoga springs, and he wrote from thence as follows: "upon my return home, I will send you half a bushel of Bene seed, and a box of oil that has been made ten years, we use no other kind, and think it as good as at the first. I think this plant will succeed in your climate, as the oca and tomatoes have done, as it seeds in time with us, if sown early in July. Warm, sandy soils, would I think, do best for it.—I have seen it grow well upon very poor sandy land. I planted Bene in 1779, my field was much mismanaged, (that year I was much absent,) and do not think it produced more than six or seven bushels per acre; but I should suppose from ten to fifteen might be expected. My crop produced about five hundred bushels, for which I received two dollars a bushel, and then became interested in its manufactory.—It produced two gallons of cold drawn oil per bushel, the seed then warmed and again pressed, gave nearly half a gallon more, which was kept by itself for inferior purposes. One cause of this oil's keeping so much better than Olive oil, is, that it is not heated in the operation. Olive oil, I understand is boiled. Mr. Sully sent me word, it was the best oil he ever used for painting."

Invited to give an opinion, I will say that all our sandy or light lands, on salt water of rivers, bays, or the ocean, from Florida to Long Island in the state of New York, will produce this plant to advantage, greater always where the summers are longest; for ripening in succession, it will continue to produce until checked by frost. When I speak of lands on the salts, I must be understood as meaning lands affected by a salt atmosphere, for it is perfectly understood, that heat and cold, are not uniformly regulated by degrees of longitude and latitude. At the moderate distance of 8 miles east from the waters of the Sassafras, the frost has destroyed every blade in a corn field, while at this place nothing was injured, and a few miles apart, say

ten or twelve; equal care being taken, peas and strawberries will be a week earlier upon salt water shores than upon fresh.

The whole of the peninsula of Maryland, Delaware and Virginia from Dover down to the Capes, is all more or less affected by vapours from the two bays and the ocean, and will I think, produce good crops of Bene. The warm river lands of Ann Arundel county, and from hence down the Chesapeake to the Capes, diverging further from the rivers as you progress to the south, will all produce Bene to advantage. The warm, river and ocean lands of New Jersey, which now produce such excellent crops of melons and sweet potatoes, are entitled to a fair experiment, for in my opinion the Bene will on them, prove a profitable crop; very rich land is not the most favourable, for it may not only run too much to stalk instead of seed, but it may grow too high for children to cut and collect the seed. It will require equal cultivation with corn, is planted in drills, from two to three plants in a hill, and the hills three feet apart.

To encourage the culture of this most valuable plant, a company should be formed in your city, which would distribute the seed, and contract to purchase for two or three years at a liberal price. The want of machinery, and of course a market, checked the culture in Georgia. There is a cautious reluctance in my fellow countrymen to attempt new crops or new modes of cultivation. No period could be more propitious than the present for introducing this plant. Our grain is of little value, while a bottle of oil maintains its war price—offer to the farmer an encouraging price, *not to be affected by a southerly wind*, and I have no doubt, but that in a few years, we shall export oil, equal if not superior to the best Olive. In such a case, we shall all be indebted to the Philadelphia friend of the plough, for first proposing the subject through the medium of your valuable paper.

I now, sir, promise through you, that nearly the whole of the seed which Mr. McQueen sends to me, shall be placed in your hands for distribution, and as I have already given my opinion of the quality of the oil, without any pretensions to correct taste, I will also send you one bottle of the oil for your own use, and one other bottle for the Philadelphia friend of the plough, and if you will instruct me, how other distributions can be made, which may encourage the culture of this most valuable plant, your wishes shall be respected.

Half a bushel of seed, carefully managed will plant a thousand acres.

I am your obd't serv't.

T. M. FORMAN.

J. S. SKINNER, Esq.

COMMUNICATED FOR THE FARMER.

Belmont August 27th, 1817.

DEAR SIR,—I have as much leisure at this moment as I may have at any time, to answer yours of the 14th August instant. I do not presume, that my opinion on a subject of such prejudice and opposition, can be of much weight, because a few practical proofs will far exceed all personal assertions. I have been

through my life a friend to deep ploughing. I never plough shallower than 5, and generally 7 inches. My soil is of various qualities: Some of it has a substratum of reddish isinglass sand, and looks when trenched 12 inches deep, like the moulderings of an old brick kiln. You may see an account of a little field of this description in our 1st volume, page 240; which will supercede any necessity of answering in detail your queries. I am of the same opinions now, which you will see mentioned in that communication; and on my own little farm, I pursue the practice of deep ploughing with every benefit I have always experienced. I prefer ploughing deep in the fall; because the winter operates favourably on the fallow. But, spring or fall, I never break up shallow. I had the last harvest, a better crop of wheat than my tenant, (a good ploughman,) and as good as any I have known—not less than 30 bushels to the acre, on a field broken up in the fall of 1815, 9 inches deep. The sod was rotted by lying undisturbed and unturned, and became itself a manure. I seed shallow, and generally harrow in my grain, with orchard grass for hay, or pasture. This is now above the stubble, and I shall mow it in a short time. I generally lime my fall or spring fallows; preferring the former season. After a crop of corn on my limed land, I generally sow wheat, (but not the same year with the corn,) and dung moderately for the wheat and grass. Without manure I would take my chance of deep, against shallow ploughing; but I am little acquainted with sowing for profitable crops without bestowing some manure, to entitle me to beneficial results. I have been informed of some sandy lands on the Eastern Shore of Maryland, which did not answer well when deep ploughed. But in most instances within my knowledge, it is so much preferable to shallow ploughing, that I have never been shaken in my opinion or practice. I have always ploughed new ground deep when it required no manure; and worn land invariably; though I assist it with manure, which is doubly more efficacious with deep, than with shallow ploughing. I know you will have to encounter many prejudices. Some rising out of honest ignorance, or wrong conceptions; and some founded in an indolent disposition to follow a beaten track. Set an example yourself, and get some neighbours to do the same. This will be the most effectual mode to force conviction. There are, no doubt, some lands on which deep ploughing will do no good. But such lands must be very little worth; or be subject to very peculiar circumstances, whereof no one can judge at a distance.

I wrote an epitome of agriculture for our almanack; but it was too copious for that publication. It is now printed as a part of our 4th volume. I will send you a copy.

On the subject of deep ploughing, I thus express myself:—

"VI. Break up deep, and be not afraid of turning up barren soil, when the nature of your ground admits this operation. Shallow ploughing up the vegetable mould deceptively serves a turn, when it is not exhausted; and its exhaustion is the certain consequence of this ill judged tillage. The air contains the

"principal store of materials for the food of plants, and will impregnate the substratum, if exposed a due length of time; especially in winter, when it receives much and parts with little; the heat of the sun being then feeble, and incapable of dispelling what the soil receives from the air. Those who object to deep much more to trench ploughing, want experience, sufficiently to test their benefits.—They have mismanaged experiments, or have been in too great haste to crop their grounds. The substratum must be exposed for a time necessary to receive the influences of the atmosphere. Indian corn, with lime, is by far the best crop, after trenching particularly, because it requires the soil to be constantly stirred and exposed. True there are some soils which neither deep nor trench ploughing will benefit; and every farmer should accommodate his practice to the nature and qualities of his soil. Over-cropping and shallow ploughing, with exhausting crops in succession, frequently cause overwhelming growths of sorrel to infest ill managed fields. Lime is the only remedy: and you will see in in Lord Dundonald's Connexion, &c. the good effects of lime which destroys the sorrel, and produced the sorrel line acid, highly friendly to wholesome and profitable vegetation. Green sorrel grows on fertile soils; but the red sorrel is a certain mark of sterility." Every body knows the use of mixing by deep ploughing, a substratum of clay with a sandy surface, and vice versa; also turning up virgin earth to mix with an exhausted surface will in winter operate on the fallow, before cropping.

I can give you no better answers to your queries. I wish you success in your agricultural objects, most sincerely.

The country people around me thought me crazy, when I trench ploughed 40 or 50 acres of my farm. The crops convinced them that insane persons hit on some good things. Some of my fields are yet the better for the operation, though my first essays were made at least 45 years ago. Although I cannot prevail on them to trench, the most of them plough deeper and better than formerly. My fields have been generally assisted by all the manure I could obtain. Lime never omitted. What I cannot manure, I do not cultivate. Miracles have ceased and no adequate returns can be expected from worm lands, without renovating fertility by artificial substitutes for the bountiful fruitfulness of nature.

Good ploughing is the foundation of all posterior operations. How roots of any plant can thrive, when they are impeded by a hard and impenetrable substratum, I am at a loss to conceive. The fact is notoriously otherwise; and one would imagine that experience would supercede the necessity of all reasoning. In England their efforts are constant in promoting aration to its greatest perfection. Ploughing matches and premiums to ploughmen, are objects of the first consideration, among those who devote their talents, time and money to the encouragement of agricultural improvement. And yet I have seen as good ploughing in this country, as ever I saw in that. But good ploughing, or good crops, never met my eye,

among those who talked about turning up clay and barren earth by deepening their furrows. A wandering exception may occur to any general observation; and one such exception is viewed by prejudice through a magnifying glass.

I should not know how to define *deep ploughing*, unless I compare it with the superficial *scratching* of too many old fashioned farmers. I call ploughing of 5 and 7 inches deep *common ploughing*; as it is with most in this quarter the usual practice. At least it is so with me.

Yours very truly,

RICHARDS PETERS.

GEO. W. JEFFREYS, Esq.

From Cox on Fruit Trees.

OF THE FITNESS OF THE CLIMATE OF THE UNITED STATES FOR THE CULTIVATION OF THE APPLE.

It has long been the opinion of accurate judges, that the middle states possess a climate eminently favourable to the production of the finer liquor and table apples: it will probably be found that the Mohawk river in New York, and the James river in Virginia, are the limits of that district of country which produces apples of the due degree of richness and flavour for both purposes. It will not be denied, that apples grow well in the interior and elevated parts of the southern States, as well as in warm and favourable exposures in the northern and eastern States; but it is not recollected, that any one variety of general reputation has been produced, beyond the limits here assigned for the fine apple country. That exquisite flavour for which the Newton Pippin, and Esopus Spitzenberg, are so much admired, and which has given such high reputation to the cider from the Hewes's Crab, the white Crab, the Greyhouse, Winesap and Harrison, can only be found within the limits here described: handsome and fair apples are found growing in the district of Maine and Nova-Scotia, but they possess little more of the characteristic flavour of the finer apples of the middle states, than those produced on the hills of St. Domingo or the plains of Georgia; cold and heat are equally necessary to the production of a fine apple; neither must predominate in too great a degree. It is remarked by Knight in his treatise on the fruits of Hereford, that the flavour of the liquor for which particular orchards in that country are celebrated, is ascribed to their warm and favourable exposure in every instance which had come to his knowledge. A writer of high reputation in our own country, the late Chancellor Livingston, remarks that the growth of trees in America, compared with Europe is five to three—this fact will probably account satisfactorily for the revival of the reputation of several English cider fruits, when transplanted to this country under the influence of a more genial climate.—In treating of this particular subject, it appears to me most correct, to adopt the rule of the sagacious and practical Miller, that, "although Linnæus has considered the apple, pear and quince, as belonging to one genus, the distinction between them is founded in nature, and they ought to be treated of separately." I shall therefore adhere to that arrangement as the most simple and intelligible.

Whether the numerous varieties of apples with which our country abounds, have proceeded from the dissemination of the seeds of apples brought here by our European ancestors, or have been produced by apples cultivated by the Aborigines before the discovery of America by the Europeans, is a question about which writers have differed, and will probably continue to differ—my own impressions are favourable to the former opinion as the most correct; as founded on that principle of vegetable nature, which establishes, that varieties have a limit to their duration; and authorises a belief that none of the Indian orchards which have been discovered in America, are more ancient than the first settlement of the Europeans on this continent.

The original species of the apple, from which all the existing varieties have been obtained, is believed to be the Crab, or *pyrus malus*; when and how the various kinds distinguished by an almost infinite diversity of size, colour and flavour, have been obtained are facts which I have never seen explained satisfactorily; they are generally supposed to be the effect of cultivation—it is sufficient for us to know, that by sowing seeds of the cultivated apples, we cannot rely with any degree of certainty on the reproduction of the same kinds, but must depend on artificial modes of continuing the variety we are desirous of cultivating, by means of the operations of ingrafting and inoculation.

From Cox on Fruit Trees.

ON THE MANGEMENT OF A FRUIT NURSERY.

The seeds generally used for this purpose, are obtained from the pomace of cider apples—they may be sown in autumn on rich ground, properly prepared by cultivation, and by the destruction of the seeds of weeds, either in broad cast, or in rows, and covered with fine earth; or they may be separated from the pomace, cleaned and dried, and preserved in a tight box or cask to be sown in the spring: the latter mode may be adopted when nurseries are to be established in new or distant situations, the former is more easy and most generally practised.

During the first season, the young trees are to be kept free from weeds, and cultivated with the hoe: they will be fit for transplanting the following spring; or as may sometimes be more convenient, in the Autumn, after the fall of the leaf. If natural fruit be the object of the cultivator, attention should be paid to the selection of seedling plants which have leaves large and thick, for such are most likely to produce a good variety of fruit. "Where a species has been ameliorated by cultivation, says professor Davy, the seeds it affords, other circumstances being similar, produce more perfect and vigorous plants; and in this way, the great improvements in the production of our fruits seem to have been effected." The same observing writer also remarks "that the seeds of plants exalted by cultivation, always furnish large and improved varieties, but the flavour and even the colour of fruit seems to be a matter of accident: thus a hundred seeds of the Golden Pippin, will always produce fine large leaved apple trees,

bearing fruit of a considerable size; but the taste and colour of the apples from each will be different, and none will be the same in kind as those of the pippin itself: some will be sweet, some sour, some bitter, some mawkish, some aromack; some yellow, some green, some red, and some streaked; all the apples however, will be much more perfect than those from the seeds of the crab, which produce trees all of the same kind, and all bearing sour and diminutive fruit."

When removed into the nursery, they should be planted in rows four feet asunder, and about twelve or eighteen inches apart in the rows—the soil should be rich, for the vigour of a young tree is one of its most valuable properties; no cultivation or soil will effectually overcome the want of it: trees will seldom fail, even when removed to a soil of different character from the nursery wherein they were raised, if they have the benefit of good cultivation and good soil; these will produce a correspondent effect on the growth of the tree wherever raised: when young trees have been planted two years, they will be fit for ingrafting in the ground; if the growth be vigorous and the soil rich, this may often be done in one year, but always in the spring: this mode of ingrafting is preferable to all others for its simplicity, economy and certainty: the earth is removed with a hoe, about an inch in depth, from the stocks, which are then sawed off, so as to leave the top of the stump rather below the level of the ground around it—the stocks are then split, the cions inserted in the clefts, and the earth drawn up so as to cover the tops of the stocks about one or two inches; leaving one or two buds of each cion exposed—no composition or clay is necessary in this operation, the covering of earth sufficiently protects the cions from the air and sun.

The operation of budding is performed in the second growth from the middle of June to the middle of August, of the second year after transplanting into the nursery; the stocks are then young and succulent, and the success pretty certain; when the stocks grow large and tall, the operation of budding is more difficult and uncertain.

In four years from the time of planting in the nursery, in a good soil, with good cultivation, the trees will have attained the height of from seven to eight feet, those of vigorous kinds will be taller, and will be fit for transplanting into the orchard. The cultivation of a nursery is effected by ploughing and harrowing, each operation twice or thrice in the season, with ploughs and harrows of a small size, with a single horse: the earth is first thrown from the trees, and then towards them, and the ground is also worked with a hoe between the trees to destroy the weeds; the more the earth is stirred and the cleaner the ground is kept, the faster will trees grow in every stage of their progress, from the seedling to the full grown tree.

In pruning trees in the nursery, care should be used not to rub them up too high; this weakens the stems and throws the growth too much in the branches which must be thinned before their removal, at the risk of checking their growth—as frequently the consequence of the great size of the head, will be an irremediable curve in the stem, while in the nursery.

Great attention is required to keep the roots

free from suckers, as neglect on this point will produce in the tree a disposition to generate suckers, which will continue through the subsequent stages of its growth, when removed into the orchard. In taking up the trees from the nursery, no care should be spared to preserve the roots uninjured and of a large size: in the early years of my practice in the planting of orchards, I frequently lost trees of fine and vigorous growth, from the injury sustained by the want of care in digging them up, or as it sometimes happened, in grubbing them up, with the loss of more than half their roots. To persons desirous of possessing fine trees, I would recommend a mode which I have adopted to a considerable extent with great success, of transplanting them from the nursery to an intermediate plantation in the garden or field; and there cultivating them for two or three years, at about four feet apart, planting a hill of potatoes with manure in the space between every four trees, and paying attention during the whole time to the formation of the stems and branches.—This mode will be found to improve the growth of the roots, extending and strengthening the feeding shoots, and ensuring a rapid and vigorous growth when transplanted a second time into the orchard: the product of the potatoes will repay the expense of manuring and cultivation, four fold.

WASHINGTON, December 2, 1820.

METEORIC REGISTER.

Washington City, November 30.

Mean temperature—morning,	36 00
do 2 P. M.	47 50
do Evening,	43 43
do for the month,	42 32

Highest, 64, on the 1st and 2d.
Least, 26, 28th.

Range of Thermometer 38 degrees.
WINDS—N. 0—S. 0—E. 0—W. 15—N. W. 12—S. W. 9—N. E. 5—S. E. 0—Calm 49.

More than five sevenths from W. semi-circle.
WEATHER—Clear 55; cloudy 27; rain or snow 8; Indian Summer, 14 days.

COMPARISONS.

Mean temperature for November—	
At Vera Cruz, 14 years,	75 20
Paris, 43 years,	42 17
Mexico, City,	58 00

Our temperature, in lat. 38 53, is nearly that of Paris, in 48 41. Difference of latitude, 9 deg. 48 min.

At Marietta, 1819,	48 21
Chilicothe, 1818, 1819,	52 89
Cincinnati, do. do,	50 90

Thus far Mr. Jefferson's notice of higher temperature beyond the mountains, is verified: comparisons for years, which will be published at a future time, will, doubtless, fully confirm his opinion. Cincinnati is very nearly on our parallel. Chilicothe and Marietta are further north.

The snow storm began here on the 11th, at 1 P. M. its commencement was later at Philadelphia, New York, &c. It was about one inch

deep here—in the northern states, from ten to twelve inches deep.

The Thermometer is suspended in shade, in open air, in the north side of a house in F. Street, seven feet above the surface, and 47 feet above tide water of the Potomac.

This morning the Mercury is at 20 above Zero. The Tiber is frozen to its mouth, and considerable ice on the shores of the Potomac.

J. MEIGS.

Gen. Land Office, Dec. 1, 1820.

Brighton, December 29, 1819.

ON DAIRY STOCK.

DEAR SIR.—The deterioration of the dairy stock of our country having become apparent to many, the subject may be deemed of sufficient consequence to merit investigation. A residence of twenty-five years in the vicinity of the great *Cattle Mart* of New England, has furnished me with opportunities of frequent observations, and also of collecting the opinions of intelligent Drovers and Graziers, from almost every section of the country, who attend the weekly fairs; where it is estimated, forty thousand head of neat cattle, and one hundred thousand sheep are annually vended, and the result is, a confirmation of the position—but proof of a more plenary character may be adduced; and that is the enhanced price of this species of stock, when it is considered that the causes which have heretofore operated to increase the price of working and beef cattle, could have but little effect on cows suitable for the dairy—for when a good *Milch Cow* will sell for as much as a good *Fat Ox*, of weight exceeding that of the cow when fattened, which has been the case for a number of years past, it may be presumed that few are slaughtered; and it may be shown in another place, that an ample supply of heifers are raised, did they possess the requisite *physical* properties. The question will naturally arise, and which must be familiar to those who have frequented the Brighton Fairs of late years, "what is the cause that there are so few good *Milch Cows* in the country?" Before we offer a theory on the subject, to show the causes which may have produced this deterioration, we may be allowed to observe, that Cows, in their wild state, afford no more milk than is necessary to nourish the calf, with the assistance which he soon begins to derive from the herbage. And that a stock *valuable for the dairy*, is the effect of long habits of domestication, of plenty of succulent food, of comfortable shelter in cold climates, and of great care to prevent a mixture of other breeds. The present race of cattle can be traced, with few exceptions, to the original stock introduced by our ancestors at a very early period of our history; and it is said they came principally from Devonshire, where, at this day, is a breed celebrated in Great Britain, for beauty of form, and as valuable for the yoke; and it is probable that in the selection, properties for the dairy were not much considered—but the peculiar circumstances under which the country was settled, have led to a system of management, and which has continued to the present time, by no means favourable to the increase of dairy stock. Cattle have constituted

The principal staple of the new settlements, and as these extended, and the population of the old town increased; the profit of consigning the calves to the butcher, and purchasing heifers, has been too tempting to be resisted, and the practice has increased in some sections of the country, so as to become very general. What is the system of management in the new settlements, and which possible may be continued in some of the old? The young cattle are, with few exceptions, without any kind of shelter during the whole of our severe winters. They are are foddered with poor hay, straw and husks, and suffered to browse in the woods, and in the spring become so feeble that they can barely crawl up the hills to crop the honey suckle clover, this luxuriant herbage soon restores them. They are brought from the pastures in fine condition, having obtained good size, and many of them beautiful forms, but they are to undergo another pinching winter! Better enabled however to struggle through the snow drifts, by an increase of bone and muscle, which nature has furnished them. But this is all she can do; neither is it necessary for her purpose, to expand the milk vessels! Can it be expected, under such a course of treatment, of the race, for nearly two centuries, but that the organs for the secretion of milk, will become diminutive? and it is well known, that when that is the case, any excess of feeding will add very little to the quantity of milk, though it may fatten the animal, yet it is from such a stock, that we in a great measure depend for a supply of Milch Cows. But another case may be assigned, and which will be considered perhaps, by those acquainted with the physiology of animals, as having much greater influence than people are generally aware of, and that is, in the selection of *Bulls*, most farmers confine their attention to *form* and *colour* only, instead of tracing their descent from a *valuable dairy stock*. It has been observed by Linnæus, that those properties of animals which relate to the *vessels*, or in scientific terms "the *cortical substance* or *vascular system*, are derived from the *male*," and among other examples, tending to confirm this opinion, he states, "that a cross from the male Angora Goat, with the common female goat, produces that fine wool, or substance called *Camel's hair*;" but that the progeny from the male common goat with the female Angora, is productive of nothing but the same worthless hair of the sire."† Should he committee view the subject as deserving attention, they will I trust, require from the claimants, for premiums on imported stock, very particular and well authenticated evidence of their descent from a pure dairy race.

The system of management that has been detailed in its consequences, extends to another object, which may be deemed of importance,

* Gorham Parsons, Esq. has a stock of goats produced by the male goat of Angora, from the common female goat, that uniformly affords Camel's hair, which is allowed by the manufacturers to be equal, if not superior, to that imported from Smyrna. Such a stock must be highly valuable in the southern and western states.

† See dissertations on the sexes of plants, by Linnæus.

and that is, the premature slaughter of vast numbers of heifers, that are turned off by the farmers as affording no promise for the dairy; many thousands of them being sold every autumn at the fairs, and if the inspection laws are not evaded, are packed and sold for beef of a very inferior quality, whereby the reputation of that staple is injured in foreign markets. To provide a remedy in some measure for this loss of capital to the state, and of profit to the farmer, would it not be expedient to offer premiums for *shayed* heifers? and also for a practical treatise on the mode of operation? The English writers on the subject, whom I have had an opportunity to consult, observe 'that there can be no doubt, but the notion of injury being done by the operation, is wholly erroneous, or without any foundation from correct observation; that the chief reason why a practice so beneficial to the interest and advantage of the farmer has been so little attended to, is the difficulty of procuring expert and proper persons to perform the operation, which is, in itself, simple;' they also observe, "that less food is required to keep or fatten them than oxen, and that the quality of the beef is fully equal. Mr. Marshall, in his "Rural Economy of Yorkshire," remarks, "that it is a fact well established in the common practice of that district, that *shayed* heifers work better and have more wind than oxen." And I have been informed by an English farmer, who used them in the state of New York, that they bear the heat of the climate much better than oxen, and on the farm or road, are as active as a horse team. Could they be substituted for horses in those employments, what an immense saving of capital!

I remain,

Dear sir,

With respect, very cordially, yours,
S. W. POMEROY.

Hon. JOSIAH QUINCY,

Chairman of the Committee on premiums.

FOR THE AMERICAN FARMER.

York Springs, 30th Nov. 1820.

JOHN S. SKINNER, Esq.

Dear Sir—The total silence which prevails through the various agricultural treatises that fill the pages of your useful publication on a point which influences the farmers of Pennsylvania to an incredible degree, has surprised me a good deal. I allude to the opinion which particularly prevails among the German farmers, that the moon and some of the planets have influence on the growth of all the objects of agricultural labour. After preparing his grounds with the utmost care, the practical German farmer of this state would consider his labour as all lost, if the almanack did not decide for him the proper days on which he should sow his grain, his clover, or his grass seed. All tap-rooted vegetables, he declares must be sowed on the decline of the moon. Those which rise above the surface of the ground, on the rise of the moon. His apples must be pulled after the full moon, or they will rot. His fences must be fixed before the full, or they will sink into the ground. His timber for use must be cut down in the wane of the

moon, and so on. There is no operation connected with husbandry, that there is not the same (I should call it) superstition attached to. And yet many persons of sound judgment tell me that these opinions are the result of experience. The German farmer will tell you that the periodical appearance of locusts is designed by Providence, to enable the rains to penetrate into the ground, by the incredible number of holes made therein to some depth, by the emerging of this single insect.

If this short letter attracts the attention of some persons qualified to inquire into the subjects thereof, it may give you some curious matter for your publication. But I request you not to give my name to the public.

Yours with respect.

THE FARMER.

BALTIMORE, FRIDAY, DECEMBER 15, 1820.

The price of grain is the best support of the farmer. A sample has been exhibited of beautiful white wheat skinned or hulled by Mr. Caleb Kirke, near Wilmington, Delaware, which is fit for *firmit*. It is done by the mill stones or machinery for making pearl or hulled barley. If our mills can do this for a toll or tenth, *firmit* may become universal, and is a noble dish.

Sour or spoiled flour can be distilled with ease and profit. This should be attended to as Indian and wheat meals of every kind, as well as rye. In any case wherein the flavour is injured, the liquor may be made into "spirits of wine," to be employed in manufactures. Manufactures save all to "rags," and "offsals." Witness glue and paper.

Pennsylvania is making *Rye Coffee*, (or a rye substitute for coffee) to great extent and profit. A bushel of rye (32 quarts) produces 54 quarts. It is used now in many families of the best livers. It is less injurious to the nerves than the proper foreign coffee. It saves his whole value to the country. It can be had in our remotest settlements. The rye must first be washed, then scalded, then left to soak until the water cools, then dried near the fire or in the sun till it becomes dry enough to be roasted like coffee, then roasted like coffee, then made with any usual fining for coffee, then used at table with sugar, cream, or milk, or in the French manner, without milk. Mill work to turn large iron plate rollers, (barrels or cylanders,) are used by several great rye coffee millers.

Present Prices of Country Produce in this Market.

Actual sales of WHEAT—WHITE 80 cts.—RED 73 to 74 cts.—Old CORN 30 to 37 cts.—New do. 33 to 34 cts RYE, 46 cts.—OATS, 26 cts.—FLAX SEED, 95 to \$1—BARLEY, 45 to 50 cts.—HAY, per ton \$15 50—STRAW, do. \$8—FLOUR, from the wagons \$3 87½—WHISKEY, from do. exclusive of barrels, 27 cents—including of barrels, 31 cts.—PORK, per bbl. \$14—BEEF, do. \$11 to \$13—BUTTER, per lb. 25 cts.—EGGS, per doz. 20 to 25 cts.—VEAL, per lb. 6 to 8 cts.—LAMB, per quarter, 37½ to 50 cts.—BEEF, per lb. best butcher's 8 to 10 cents.—CHICKENS, per doz. \$2 50—TURKEYS, 75 cts. to \$1—GESE, 50 to 62½—HAMS, 12 to 14 cts.—MIDDINGS, 10 cents.—POTATOES, 37½ cts.—LIVE CATTLE, \$4 50 to \$6. London WHITE LEAD, \$4 25—American do. \$3 75—Boiled OIL, \$1 37½—FEATHERS, 50 to 62½ cts.—TAR, \$2—TURPENTINE, soft, \$2—SPIRITS, do. 55 cents.—PITCH, \$2 25—LARD, 11 to 12 cents.—SHINGLES, best deep Creek, \$8 50—Do. small \$4 75—FLOORING PLANK, 5.4 \$27—COTTON, Upland, 15 to 17 cts.

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